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PROBLEMS FOR SOLUTION.

ALGEBRA.

240. Proposed by W. J. GREENSTREET, M. A., Editor The Mathematical Gazette, Stroud, England.

Let $S_{n-1} = 1^{n-1} + 2^{n-1} + 3^{n-1} + \dots + (n-1)^{n-1}$. Find n if $S_{n-1} - (n-1)$ is a multiple of n^2 .

341. Proposed by O. L. CALLICOTT, Gettysburg, South Dakota.

Prove that the sum of the series, $\frac{1}{1.2} + \frac{1}{3.4} + \frac{1}{5.6} + \dots$ to infinity = the sum of the series $\frac{1}{2} \cdot 1 + \frac{1}{2^2} \cdot \frac{1}{2} + \frac{1}{2^3} \cdot \frac{1}{3} + \frac{1}{2^4} \cdot \frac{1}{4} + \dots$ to infinity.

342. Proposed by E. B. ESCOTT, Ann Arbor, Michigan.

Prove that $\frac{1}{1.2.3.4} + \frac{1}{5.6.7.8} + \dots = \frac{1}{4} \log 2 - \frac{1}{2^4} \pi$. [Hobson's *Plane Trigonometry*, page 348.]

GEOMETRY.

371. Proposed by W. S. HUGHES, Student, Williams College.

A right circular cone is cut by two parallel planes, one passing through the vertex, and each cutting both nappes. Are the straight lines which constitute the first section parallel to the asymptotes of the hyperbola forming the other section?

372. Proposed by DANIEL KRETH, Oxford, Iowa.

In the right triangle ADE right angle A , are given: $AB=9$, $BC=280$, $CD=35$, angle AEB =angle CED ; required the distance AE .

373. Proposed by S. LEFSEHETZ, East Pittsburg, Pa.

Draw a circle passing through a given point and orthogonal to two given circles.

CALCULUS.

297. Proposed by PROF. L. C. WALKER, Socorro, New Mexico.

A square hole $2s$ on a side is cut through an ellipsoid, axes $2a$, $2b$, $2c$, the axis of the hole coinciding with the axis $2c$ of the ellipsoid. Find (1) the volume, and (2) the surface removed.

298. Proposed by C. N. SCHMALL, New York City.

Prove, by calculus, that if two regular polygons have equal perimeters, that which has the greater number of sides has the greater area.

399. Proposed by JOSEPH V. COLLINS, Ph. D., State Normal School, Stevens Point, Wisconsin.

A cow is pasturing outside a circular field containing 10 acres. What length of rope will allow her to graze over exactly two acres?